

**Notice of Allowability**

Application No.

10/533,936

Examiner

John S. Chu

Applicant(s)

SON ET AL.

Art Unit

1795

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 10/10/07.
2. ☒ The allowed claim(s) is/are 1-16.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
  1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

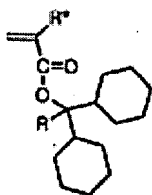
1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

**REASONS FOR ALLOWANCE**

1. The following is an examiner's statement of reasons for allowance: The claimed invention is drawn to the following monomer, copolymer and chemically amplified resist composition:

1. (Previously presented) 1-Alkyl-1-dicyclohexyl (meth)acrylate represented by the following formula 1:

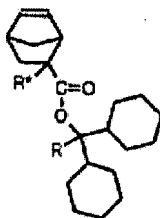
[Formula 1]



wherein R is an ethyl group, and R\* is a hydrogen or a methyl group.

3. (Original) 2-Alkyl-2-dicyclohexyl-5-norbornene-2-carboxylate represented by the following formula 2:

[Formula 2]



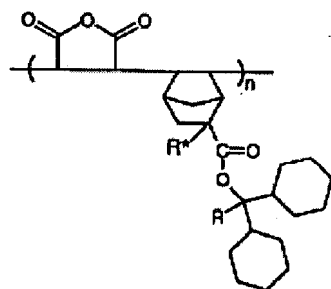
wherein R is a methyl or ethyl group, and R is a hydrogen or a methyl group.

Art Unit: 1795

5. (Original) A photosensitive copolymer represented by the following formula

3:

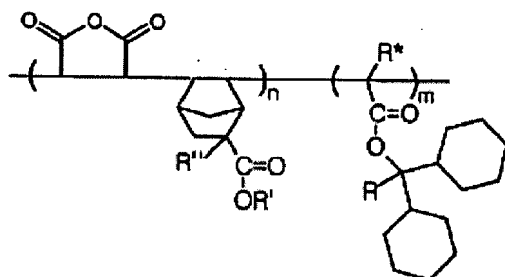
[Formula 3]



wherein  $R$  is a methyl or ethyl,  $R^*$  is a hydrogen or a methyl, and  $n$  is an integer of 20 to 25.

7. (Previously presented) A photosensitive terpolymer represented by the following formula 4:

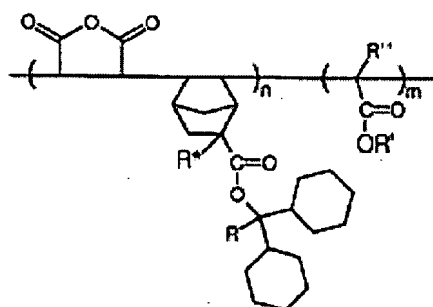
[Formula 4]



Art Unit: 1795

9. (Original) A photosensitive terpolymer represented by the following formula 5:

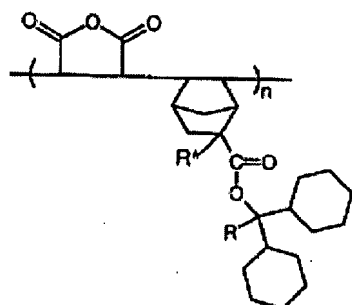
[Formula 5]



wherein R is a methyl or ethyl group; R\* is a hydrogen or a methyl group; R' is a hydrogen, an alkyl group, or a hydroxyalkyl group; R'' is a hydrogen or a methyl group; and m and n each satisfy the conditions  $m+n=1$ ,  $0.1 < m < 0.9$ , and  $0.1 < n < 0.9$ .

11. (Currently amended) A chemically amplified positive photoresist composition for ArF comprising one or more polymers selected from the group consisting of the photosensitive copolymer of the following formula 3, the photosensitive terpolymer of the following formula 4, and the photosensitive terpolymer of the following formula 5:

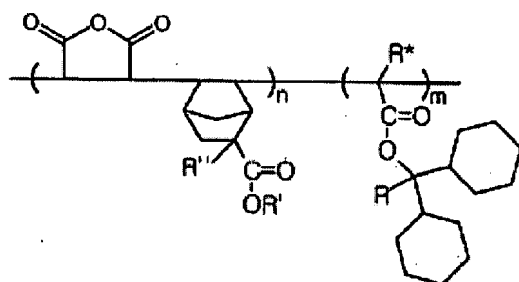
[Formula 3]



wherein R is a methyl or an ethyl group; R\* is a hydrogen or a methyl group; R' is a

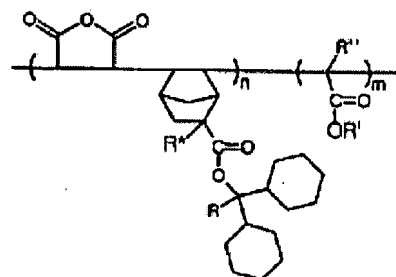
Art Unit: 1795

[Formula 4]



wherein R is an ethyl group; R\* is a hydrogen or a methyl group; R' is a hydrogen, an alkyl group, or a hydroxyalkyl group; R'' is a hydrogen or a methyl group; and m and n each satisfy the conditions  $m+n=1$ ,  $0.1 < m < 0.9$ , and  $0.1 < n < 0.9$ ; and

[Formula 5]



wherein R is a methyl or ethyl group; R\* is a hydrogen or a methyl group; R' is a hydrogen, an alkyl group, or a hydroxyalkyl group; R'' is a hydrogen or a methyl group; and m and n each satisfy the conditions  $m+n=1$ ,  $0.1 < m < 0.9$ , and  $0.1 < n < 0.9$ .

The inventive step is the presence of the monomer unit of [Formula 1] and [Formula 2], wherein the R group in formula I is an ethyl group. This recitation is not met by the prior art references of record. The monomer unit of formula [2] is not disclosed the prior art references of record wherein a bicycloaliphatic group has the carboxylic acid ester of a dicyclohexyl group as seen in claim 2. Finally the use of the monomer units in a copolymer that is formulated in a chemically amplified photoresist composition is not taught in the prior art references of record.

Art Unit: 1795

Because none of the prior art references of record disclose or anticipate the recited monomer unit, a copolymer unit or a chemically amplified photoresist composition as recited, claims 1-16 are seen as allowable and passed to issue.

2. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Chu whose telephone number is (571) 272-1329. The examiner can normally be reached on Monday - Friday from 9:30 am to 6:00 pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Cynthia Kelly, can be reached on (571) 272-1526

The fax phone number for the USPTO is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PMR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/John S. Chu/  
Primary Examiner, Group 1700

J.Chu  
October 23, 2007